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10/538,387	06/13/2005	Koji Otsuka	05-429	5724

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NEW HAVEN, CT 06510

EXAMINER

CARTER, WILLIAM JOSEPH

ART UNIT	PAPER NUMBER
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2875

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/538,387

Applicant(s)

OTSUKA ET AL.

Examiner

William J. Carter

Art Unit

2875

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 June 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Objections

Claims 12 and 19 are objected to because of the following informalities:

In claim 12, line 6, "the both ends" lacks antecedent basis.

In claim 19, lines 2-3, "the lower light-reflectivity" and "the higher light permeability" lack antecedent basis.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 12, 13, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mezei et al. (6,910,783) in view of Song et al. (2003/0116769).

With respect to claims 12 and 15, Mezei teaches a semiconductor light-emitting device (Fig. 3) comprising an elongated light transmitter (1), a pair of semiconductor light-emitting elements (6) disposed on opposite ends of the transmitter (Fig. 3) mounted toward the transmitter for emitting a light which is introduced into the transmitter from the both ends thereof to radiate light outside from an outer peripheral surface of the transmitter (Fig. 3), and the transmitter is formed of transparent or translucent glass or resin(column 3, line 66-column 4, line 3) into a hollow or solid

Art Unit: 2875

cylindrical shape (Fig. 3). Mezei does not explicitly teach the semiconductor light-emitting element each mounted on heat sinks, a plastic encapsulant formed with an annular groove to envelop main and side surfaces of the heat sink by the plastic encapsulant, wherein each of the heat sinks comprises a reflector integrally formed with or secured on a main surface of the heat sink, the reflector has a flaring inner surface which gradually expands toward the transmitter to surround the semiconductor light-emitting element, and each end of the transmitter is fitted into the annular groove to join each end of the transmitter to the reflector; and the reflector is formed of an electrically conductive metallic material, a lead wire passes through a notch of the reflector to electrically connect the semiconductor light-emitting element and an outer lead. Song, also drawn to semiconductor light-emitting devices, teaches in a second embodiment a semiconductor light-emitting element (155) each mounted on a heat sink (170), a plastic encapsulant (159) formed to envelop main and side surfaces of the heat sink by the plastic encapsulant (Fig. 4a), wherein each of the heat sinks comprises a reflector integrally formed with or secured on a main surface of the heat sink (Abstract), the reflector has a flaring inner surface (R and r) which gradually expands toward the transmitter to surround the semiconductor light-emitting element (Figs. 3 and 4a); and the reflector is formed of an electrically conductive metallic material (paragraph 34), a lead wire (3a and 3b) passes through a notch of the reflector to electrically connect the semiconductor light-emitting element and an outer lead (paragraph 7). It would have been obvious to one of ordinary skill in the art, at the time of the invention, to use the LEDs of Song in the semiconductor light-emitting device of Mezei, in order to improve

heat dissipation in addition to easily controlling its luminance and angular distribution of its luminance (paragraph 13). In the fifth embodiment Song teaches an annular groove (groove that accepts 280 in Fig. 7) end of the transmitter (280) is fitted into the annular groove to join each end of the transmitter to the reflector (270). It would have been obvious to one of ordinary skill in the art, at the time of the invention, to use the groove of the fifth embodiment, in order to connect the semiconductor light-emitting element to a transmitter (Fig. 7).

As for claim 13, Mezei further teaches a light reflective film (15; column 5, line 7) formed at least on a portion of out or inner peripheral surface (Figs. 16 and 18) of the transmitter (1).

As for claim 16, Mezei and Song teach all of the disclosed elements, which are assembled as claimed, thus the method is inherently taught.

Claims 14, 17, 18, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mezei and Song as applied to claim 12 above, and further in view of Simon (5,915,823).

With respect to claims 14, 17, 18, and 20, Mezei and Song teach all of the claimed elements, as discussed above, except for explicitly teaching light introduced through a lens portion into the transmitter, a plurality of half-mirrors provided in the light transmitter for reflecting light introduced into the light transmitter from light-emitting element out of the light transmitter through the irradiation surface, and at least one total reflection mirror provided inside the half-mirrors in the light transmitter, wherein the total reflection mirror reflects light permeated through the half-mirrors toward the outside of

Art Unit: 2875

the light transmitter through the irradiation surface; the half mirrors being across and inclined at a certain angle to a longitudinal central line of the light transmitter; and wherein the half-mirror formed into a plate shape is sandwiched between a plurality of segments of the light transmitter. Simon, also drawn to linear light sources, teaches light introduced through a lens (21) portion into the transmitter (Fig. 1), a plurality of half-mirrors (24-1 and 24-2) provided in the light transmitter for reflecting light introduced into the light transmitter from light-emitting element out of the light transmitter through the irradiation surface (Fig. 8), and at least one total reflection mirror (24-3) provided inside the half-mirrors in the light transmitter, wherein the total reflection mirror reflects light permeated through the half-mirrors toward the outside of the light transmitter through the irradiation surface (Fig. 8); the half mirrors being across and inclined at a certain angle to a longitudinal central line of the light transmitter (column 7, lines 54-57); and wherein the half-mirror formed into a plate shape is sandwiched between a plurality of segments of the light transmitter (Fig. 8). It would have been obvious to one of ordinary skill in the art, at the time of the invention, to use the mirrors of Simon in the linear light source of Mezei, in order to be able to direct radially distributed light beams in any of a number of selected configurations (column 2, lines 47-52). Upon combination of Simon and Mezei, the light-emitting elements would be disposed on both sides of the light transmitter, requiring the mirrors of Simon to be oriented toward each light source, the way it is oriented toward the single light source shown in Fig. 8. Upon this combination the total reflection mirror (24-3) would be provided inside the half-mirrors (24-1 and 24-2) in the light transmitter (Fig. 8).

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mezei, Song, and Simon as applied to claim 17 above, and further in view of Haga (5,583,632).

With respect to claim 19, Mezei, Song, and Simon teach all of the claimed elements, as discussed above, as well as Simon teaches changing the light-reflectivity and the light permeability of the half-mirrors (column 8, lines 14-19). Mezei, Song, and Simon do not explicitly teach the half-mirrors have a lower light-reflectivity and a higher light permeability, the closer the half-mirrors are disposed to the semiconductor light-emitting element. Haga, drawn to lighting, teaches half-mirrors (121 and 122) having a lower light-reflectivity and a higher light permeability (column 12, lines 5-12; the first half mirror (121) lets all of the laser light pass and the second half mirror (122) reflects some of the laser light making it more reflective and less permeable than the first half mirror), the closer the half-mirrors are disposed to a light-emitting element (22a). It would have been obvious to one of ordinary skill in the art, at the time of the invention, to use the mirrors of Haga in the linear light source of Mezei, in order to control the light levels to a predetermined value (column 4, lines 20-26).

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mezei, Song, and Simon as applied to claim 17 above, and further in view of Sano et al. (6,419,306).

With respect to claim 21, Mezei, Song, and Simon teach all of the claimed elements, as discussed above, as well as Simon teaches at least one inclined surface of the plural segments of the light transmitter, and the inclined surface of the plural segments are in contact to each other (Fig. 8). Mezei, Song, and Simon do not explicitly

teach half-mirrors are formed by vapor deposition. Sano, also drawn to linear light sources, teaches half-mirrors formed by vapor deposition (column 5, lines 13-20). It would have been obvious to one of ordinary skill in the art, at the time of the invention, to use the vapor deposition of Sano on the half-mirrors of Simon, in order to form a layer that is thick enough to reflect light and so as to be thin enough to transmit light (column 5, lines 13-20).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William J. Carter whose telephone number is (571)272-0959. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra L. O'Shea can be reached on (571)272-2378. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Wjc
08/09/07

/Ali Alavi/
Primary Examiner